



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Water Use Advisory Council

September 15, 2020

1. Welcome

WUAC Meeting Materials and Access Information

https://www.michigan.gov/egle/0,9429,7-135-3313_3684_64633-538211-,00.html

WUAC Chair Order for 9/15

- Laura Campbell, Manager (Items 1-6)
Agricultural Ecology Department
Michigan Farm Bureau
- Bryan Burroughs, Executive Director (Items 6-10)
Michigan Trout Unlimited

Co-Chair Laura Campbell

Agenda Items 1-6

2. Roll Call

3. Approval of Agenda –Roll Call Vote

4. Approval of Minutes—Roll Call Vote

**Water Use Advisory Council (WUAC) Meeting
Tuesday, September 15, 2020
1:00 p.m.-4:00 p.m.
On Teams Hosted by the Department of Environment, Great Lakes, and Energy (EGLE)**

AGENDA

1. Welcome
2. Roll Call
3. Approval of Agenda
4. Approval of Minutes
5. Public Comment
6. **Presentation of Committee Report Recommendations**
 - Data Collection Committee (40 minutes)
 - Models Committee (40 minutes)
 - BREAK –5 Minute*
 - New Topics Committee (40 minutes)
 - Implementation Strategies Committee (20 minutes)
7. Discussion Regarding Additional Meeting on November 10, 2020
8. Next Meetings
 - October 20, 2020
 - December 15, 2020
9. Open comments
10. Motion to Adjourn

5. Public Comment

Goals of December 2020 Report

- More concise
- Easy to understand
- Highlight achievements
- Limited recommendations
- Implementation strategy
- Digital format only
- Goal is to present one clear voice to the Legislature

Recommendation Format

- Recommendation Title/Name
- Synopsis clearly explaining issue, impact and anticipated outcomes
- Recommendation Actions
- Implementing Organization
- Cost Analysis and Funding Recommendation
- Legislative changes if applicable
- Timeframe

6. Presentation of Committee Report Recommendations

Data Committee

Presentation of work and report findings/ recommendations

September 15, 2020

Water Use Advisory Council

Data Committee work and focus

- Started with review of all previous WUAC recommendations; Environmental Monitoring & Inland Lakes ARI's
- Reviewed and discussed each of these at length to gain group consensus of status and needs to fully implement
- Developed new topic clusters of previous rec's based on content
- EM2.1 – water management data framework development
- EM 1.1, 1.2, 2.3 (and 1.6?) – new data acquisition prioritization (streamflow, groundwater, geology; high use areas and critical statewide gaps)
- EM 2.2, 1.5, 1.3, and 1.4 - Data collection methodology, standards, protocols and procedures for use in this program
- IL 2.2a and IL 1.1 – inland lakes
- EM 2.5 – well drillers and trainings
- EM2.4 & 1.7 – referred to Models Committee
- All other IL recommendations – largely deferred to a later date before action is warranted.

MI Integrated Water Management Database

WUAC Data Comm – D. Hamilton presenter (~5 min)

- **Previous WUAC 2014 recommendation, EM2.1 – water management data framework development**
- Problems: Multiple existing databases, non-linked, gaps exist, need some gaps filled and adjustments made and linking; emerging need to integrate water quality info with water quantity info. Haphazard, indendpent, and limited databases are restricting use of available data to improve water management.
- A lot of details involved in how to get this done, from coordination and technical perspectives.
- **Recommended Actions** : The WUAC recommends that the legislature appropriate \$170,000 to be expended over two fiscal years by an external contractor who will compile and derive the Michigan Integrated Water Management Database according to the protocols approved by the Council.
- **Cost:** \$170,000
- **Implementing Organization:** The WUAC will coordinate with the department as work plans are developed and contractors selected. A multi-agency GIS committee, composed of representatives from EGLE, MDNR, MDARD and DTMB, should be established. Through this committee, led by the EGLE, Water Resources Division, each agency will assume stewardship of selected elements of the Integrated Water Management Database and work with DTMB to develop an appropriate maintenance schedule for them.
- **Timeframe**
- Two years from start of contracts.

New Data Acquisition

WUAC Data Comm – B.Burroughs (~5 mins for next 3 slides)

- EM 1.1, 1.2, 2.3, 1.6 – new data acquisition prioritization (streamflow, groundwater, geology; high use areas and critical statewide gaps)
- Streamflow, groundwater, and geology information improvements needed.
- Comprehensive needs will require large investments and longterm strategy.
- Shortterm Need – includes maintenance of existing levels of data acquisition, modest increases, and investment for development of a formal network analysis of gaps for each type, and prioritization scheme among types, and refined cost estimates for acquisition strategies

New Data Acquisition - Planning

WUAC Data Comm – B.Burroughs presenter

- Water use management data acquisition plan development
- **Recommended Actions.** The WUAC recommends that it coordinate development of an overall long-term plan for the acquisition of water management data needs. This entails formal analysis and communication of all forms of existing streamflow, groundwater and geological data by type and locations within Michigan, identification of critical data gaps and needs, and development of priority needs and cost-efficient strategies for data collection.
- **Cost:** \$100,000 (for technical resources contracting)
- **Implementing Organization:** WUAC, EGLE, USGS, MGS
- **Timeframe:** 2 years

New Data Acquisition – Streamflow

WUAC Data Comm – B.Burroughs presenter

- USGS gages and “Miscellaneous measures” of streamflow; need to increase, but for now are asking that funds for existing level be secured (existing source (CMI) ends before FY2022).
- **Recommended Actions.** The WUAC recommends that existing levels of streamflow data acquisition supporting the program, receive funding in FY2022 budget, so that they can continue to be collected at the modest existing levels.
- **Cost:** \$350,000
- **Implementing Organization:** EGLE, USGS
- **Timeframe:** replacement funding needed starting in State FY2022 budget

New Data Acquisition – Groundwater

WUAC Data Comm – R.Haefner (~5 min)

- MI's groundwater monitoring well network is inadequate, and needs to expand
- **Recommended Actions.** Implement a plan for a more comprehensive groundwater network throughout Michigan. This will be accomplished in a four-task approach of initial evaluation, field evaluation, network implementation, and operation and maintenance. Number of monitoring wells to be decided, but estimate is based off approx. 2 per county.
- WUAC recommends that EGLE join the National Groundwater Monitoring Network (<https://cida.usgs.gov/ngwmn/>) to increase awareness among various divisions in EGLE on existing groundwater monitoring wells and data to allow for interdepartmental efficiencies. Doing so benefits data organization and use and makes matching funds eligible for groundwater monitoring networks.
- **Cost:** \$259,000 during the first year; \$226,000 in subsequent years subject to cost increases due to inflation. USGS will consider up to 25% match through its' Cooperative Matching Funds program (subject to availability).
- **Implementing Organization:** USGS
- **Timeframe:** Program could start immediately, and annual costs would continue for the life of the program.

New Data Acquisition – Geology - #1

WUAC Data Comm – D. Lusch (~3 min)

- 3D Glacial Aquifer Mapping in 4 Michigan Counties
- **Recommended Actions.** The WUAC strongly recommends that the legislature allocates \$120,000 to the EGLE, Water Use Program to be expended across two fiscal years by an external contractor who will map the 3D aquifer properties of four counties using the transition probability geostatistical approach. The EGLE, Water Use Program will select Cass County and three other counties where the contractor will develop a 3-D realization of the glacial aquifer materials that extends from the land surface to the top of the bedrock surface (in counties where both glacial and bedrock aquifers are used) or to the bottom of the screened interval in all the wells in counties where the bedrock is not an aquifer. Only counties where the locations of Wellogic well records have been verified shall be selected.
- **Cost:** \$120,000
- **Implementing Organization:** EGLE, through
- **Timeframe:** 2 years

New Data Acquisition – Geology - #2

WUAC Data Comm – J. Yellich (~3 min)

- Expanding Geologic Mapping of targets areas of Michigan
- Continuing efforts to collect geologic surveys by county, proposal approximately provides for 2 counties per year
- **Recommended Actions:** These MGS mapping projects would expand existing geologic information with data from drilling, soil sampling, passive seismic, and gamma-ray logging to produce composite surficial geology maps that include bedrock topography, thickness of glacial deposits and static groundwater elevations. The WUAC strongly recommends that the legislature allocates at least \$3,000,000 of recurring, operating funds.
- **Cost:** \$3,000,000 per year
- **Implementing Organization:** MGS, EGLE
- **Timeframe:** Considering recurring funding and implementation for next 10 years

Continuing Well-driller data reporting trainings

WUAC Data Comm – J. Yellich (~5 min for next two slides)

- EM 2.5 – well drillers trainings for data recording to aid the program
- Ongoing annual efforts to help train well drillers on improved lithology data reporting are beneficial and very valuable (getting better data recorded from their drilling efforts is cost-efficient compared with entirely new data acquisition efforts).
- **Recommended Actions:** Continuing annual trainings for well drillers, to help support better and more informative data submitted into Wellogis, benefits this program through acquisition of more useful and reliable data. WUAC recommends a state investment of \$3,600 every two years to continue this effort.
- **Cost Investment Proposed:** \$1,800 per year for 2 years, total \$3,600, for financial coverage of MGS efforts to host these trainings. EGLE staff time for participation, provided as part of existing core staffing support and programs. MGA helps promote and organize.
- **Implementing Organization:** MGS, EGLE
- **Timeframe:** annual, next two years

Well-owner outreach on registration completion requirements

WUAC Data Comm – J. Yellich

- In order to help ensure better compliance with well completion reporting, a letter was developed for distribution to well-owners, to help them better understand responsibilities for reporting under the program.
- **Recommended Actions:** EGLE, MGA, FB, MGS participated in developing an informational letter that will be distributed as outreach efforts on well completion reporting.
- **Cost:** none
- **Implementing Organization:** EGLE, FB, MGA
- **Timeframe:**

Data collection and use standards and protocols

WUAC Data Comm – B.Burroughs (~3 min)

- EM 2.2, 1.5, 1.3, and 1.4 - Data collection methodology, standards, protocols and procedures for use in this program
- Many of components of this cluster of previous recommendations have been accomplished (e.g., adopting USGS standards, creating new ones for certain data). Some gaps still exist that need to be addressed (e.g., protocols or standards for the use of data for particular uses in this program), and some new ones are likely to emerge.
- **Recommendation:** WUAC Data committee continues to work with agencies to address these gaps in 2021. Recommended fixes to come before WUAC for review.
- **Cost** - no new investment proposed
- **Timeframe:** as completed, 2021 anticipated, as part of ongoing WUAC work

Inland Lake ARI's

WUAC Data Comm – B.Burroughs (~2 min)

- IL 2.2a and IL 1.1 – inland lakes. Most previous IL rec's are dependent on these two primary ones being accomplished. EGLE is progressing on bathymetric data acquisition tools development.
- **Recommendation:** A full framework and data to support ARI assessment for Inland lakes and wetlands is still not functional possible at this time. Building off of previous WUAC recommendations will require development of mechanistic pathway for ARI's, and development of sensitivity classifications for waterbodies, and is expected to require new data acquisition to support it. WUAC is recommending that it continue work on this topic.
- **Cost** – none proposed at this time

Question & Answer

WUAC Data Comm – all committee members as needed

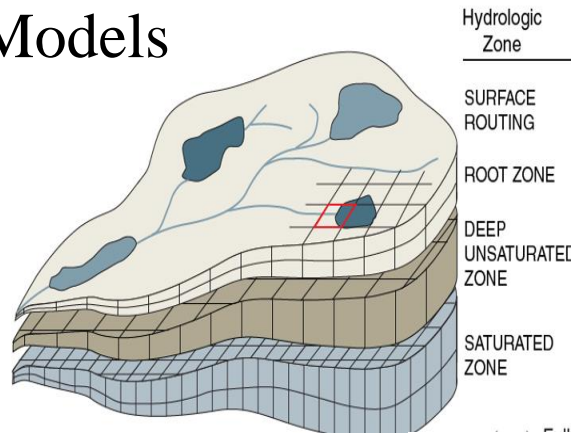
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Models Committee Update

Models Committee Recommendations:

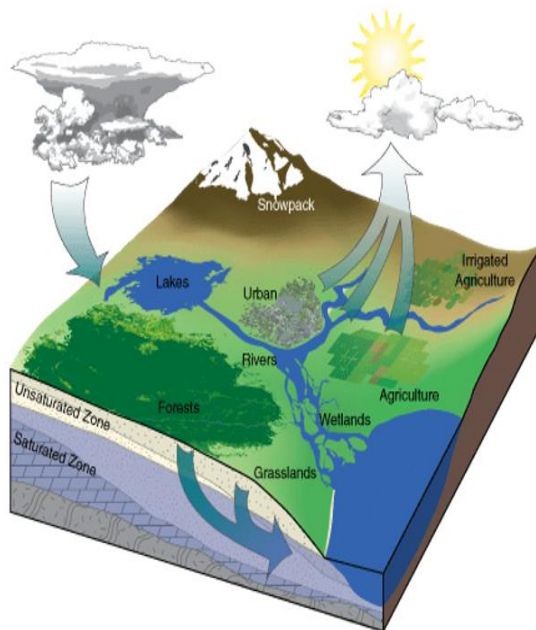
1. Michigan Hydrologic Framework
2. Improvements to the WWAT and Process:
 - a. Update user interface to display registration info
 - b. Identify WMAs that have been modified by SSR
 - c. Provide better estimates of aquifer properties
 - d. Develop tools to better represent streamflow depletion
3. Incorporate information from calibrated models to screening tool
4. Follow up on Cass County model

Hydrologic Models



Kendall (2009)

Real World



GIS Data Layers (Framework)

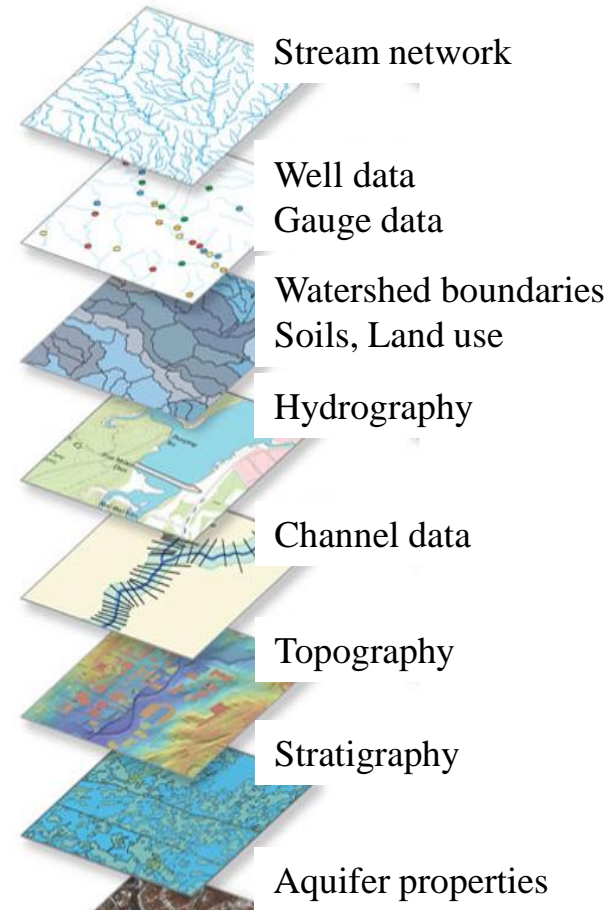
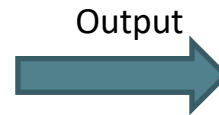


Figure 1 From the “real world”, hydrologic data can be measured and physical attributes can be geographically described, and stored in GIS layers. These can be used to create hydrologic models, and the output can be analyzed and stored in GIS layers.

Michigan Hydrologic Framework

Summary of Framework capabilities:

- Statewide GIS data bases
- Incorporate model results into decision framework
- Access data, analysis, and model results
- Create Smartmap
- Incorporate new data and analysis
- House or link to the Michigan Integrated Water Management Database
- Facilitate creation of models that link climate, surface water and groundwater

➤ Create MHF (\$850,000), and create and incorporate 3 regional models (\$1,200,000)
Total \$2,050,000 over 3 years

Improvements to the WWAT and Process:

➤ **Update user interface to display registration information**

None of the WWAT's data on registrations, their individual impact, or their cumulative impact and the current status of a watershed is available to the user. This information is useful to users and consultants. It will save EGLE staff time and money to provide this information automatically in the WWAT.

➤ **Identify WMAs that have been modified by SSR**

This information is useful to planners and researchers. EGLE can provide this by developing a periodic report. Or the database could be modified to track and make the information directly available to the public.

Costs for these are unknown because DTMB would do the work. Estimates are as high as \$50,000 each.

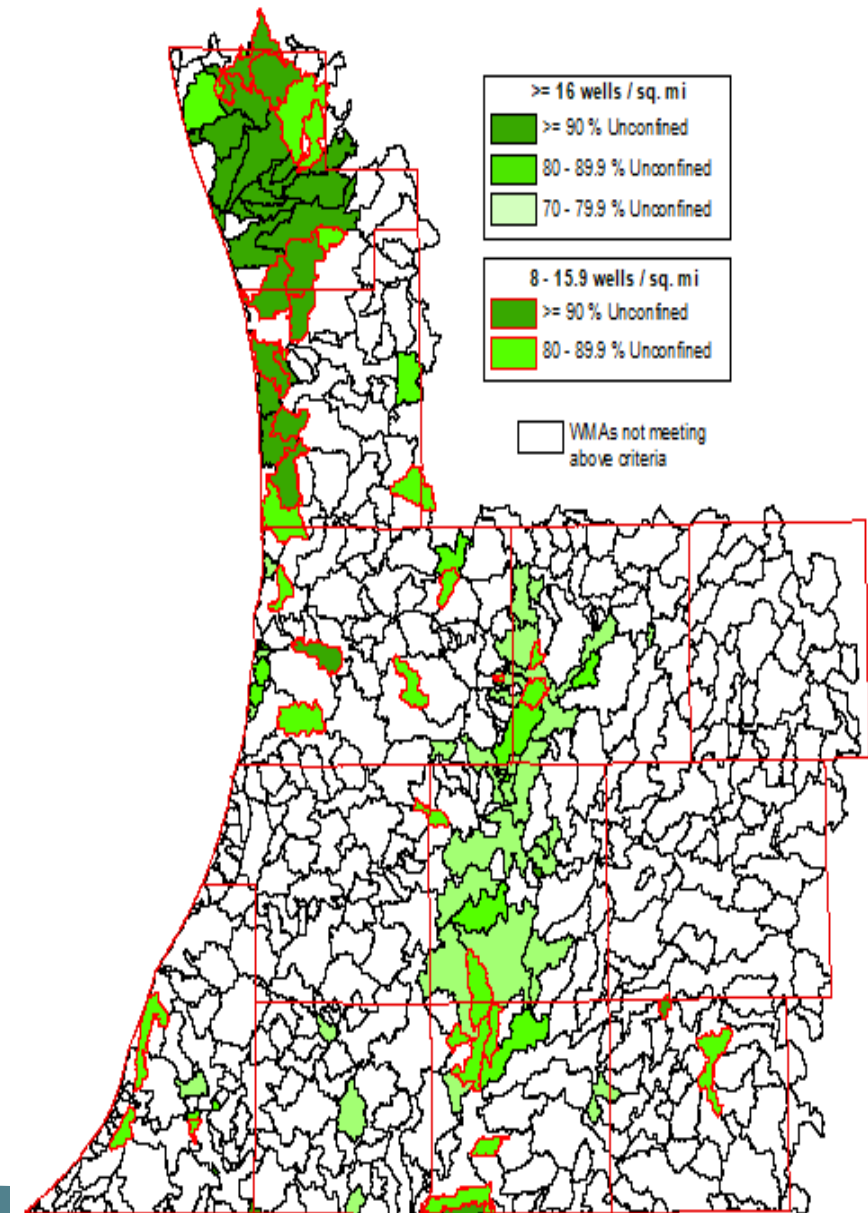
Compiling Aquifer Properties for the WWAT

- Use a GIS method to identify all Water Management Areas (WMAs) that are dominated by unconfined, glacial aquifer conditions. Applying a higher storage coefficient will better reflect the local aquifer characteristics, and provide better estimates of streamflow depletion.
- The number of well logs with standardized aquifer properties has greatly increased. EGLE has compiled information from irrigation aquifer tests. Combined, these will allow the statewide estimates of transmissivity for both the glacial and bedrock aquifers to be significantly improved.
 1. An **external contractor** (\$12,000) to (a) compile and derive statewide estimates of transmissivity for both the glacial and bedrock aquifers; and (b) identify all WMAs statewide that are dominated by unconfined, glacial aquifer conditions.
 2. **DTMB, CSS** (\$88,000) to (a) incorporate the new estimates of transmissivity into the WWAT and (b) program the WWAT to utilize a storage coefficient of 0.10 in all WMAs that dominated by unconfined, glacial aquifer conditions.

WMAs dominated by unconfined, glacial aquifer conditions

WMAs containing

- a) 16 or more wells per square mile of which at least 70% are unconfined, or
- b) at least 8, but less than 16 wells per square mile of which at least 80% are unconfined shall have their storage coefficients increased to 0.10.



Improvements to the WWAT and Process:

- Develop tools to better represent streamflow depletion

A technical workgroup is exploring options. No recommendations at this time.

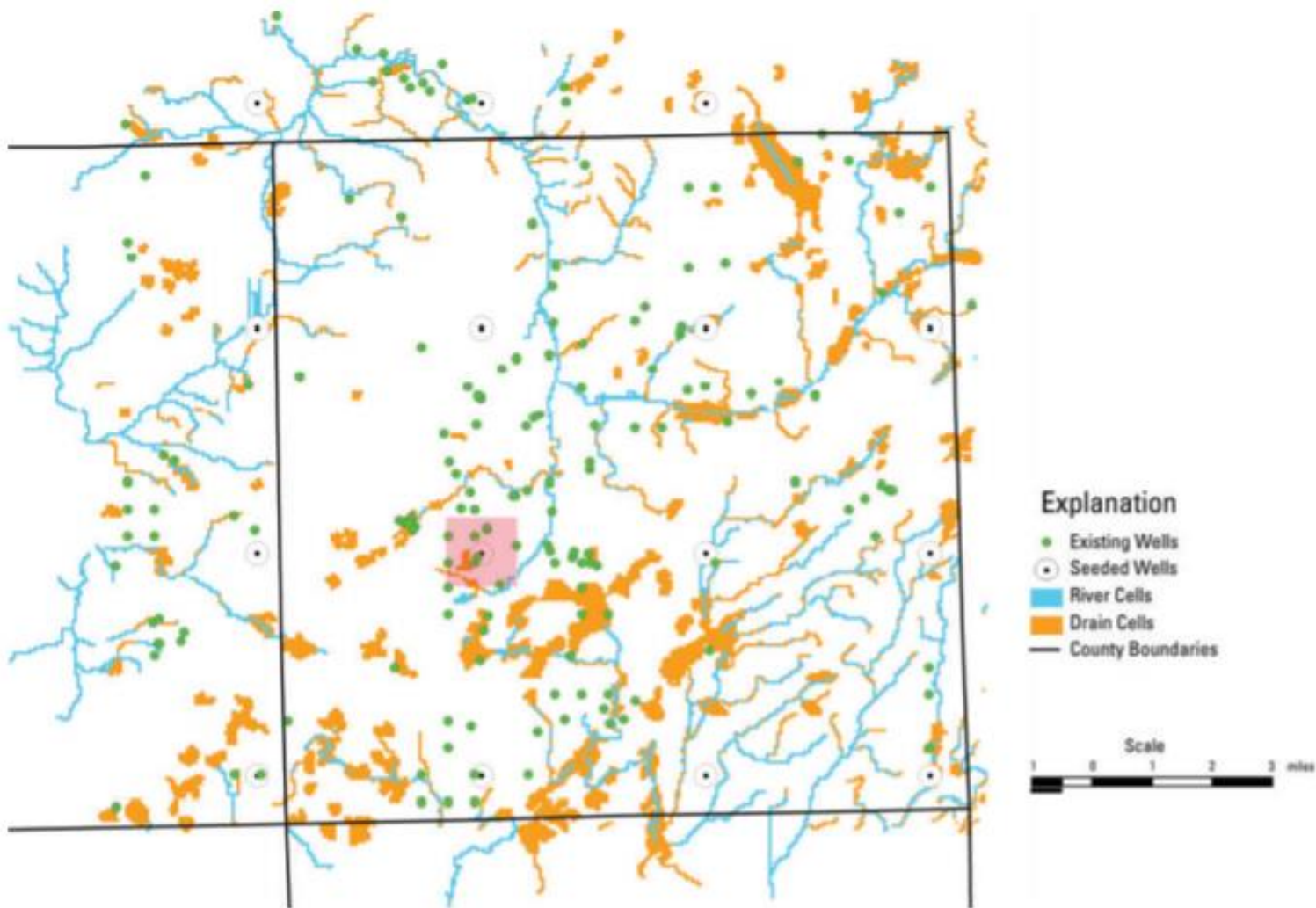
Incorporate information from calibrated models to screening tool

A numerical groundwater model can be developed to accurately represent an area, including the stream/aquifer interactions, and account for the local water budget, with the goal to reasonably represent the streamflow depletion that occurs from area wells. Such a model can readily be used in the SSR process, but it can take many minutes to hours for it to run a solution for a new well. Therefore, it cannot be used directly in the screening process.

A metamodel is a computationally efficient surrogate for a more detailed numerical model. The numerical model can be run many hundreds, or thousands, of times determining the streamflow depletion for wells at different locations, and pumping different rates. The results can be statistically modeled. This statistical model (metamodel) can be used to rapidly predict the depletion from a new well. It could become part of the screening tool. There are many possible statistical modeling approaches.

Recommendation: Evaluate metamodeling approaches. Develop and test a metamodel with a well calibrated numerical groundwater model. Determine the metamodel's accuracy , and if it can be reliably designed to provide reasonable, yet conservative, solutions in the screening tool.

Cost: \$50,000 if done as part of a model development in MHF, \$100,000 if a stand alone project. Timeframe one year.



Seeded wells and other model features in Kalamazoo County, Michigan. Red box shows local square area around example seeded well.

Follow up on Cass County model

We will discuss this at our next Council meeting. We hope to have a plan to move forward with the model. We do not expect to have this as part of our budget request, but we expect the Council will help provide leadership in the next steps.

5 Minute Break

Co-Chair Bryan Burroughs

Agenda Items 6-10

New Topics Committee Update

- 1) Water User Groups
- 2) Water Conservation and Efficiency



Water Users Group Planning Committee SEPTEMBER UPDATE

- Committee met on Aug 25, 2020
- Motivation Statement
- Summary of FAQs about the Water Use Program interaction with Water User Committees, and Michigan water law and rights
- Water Users Group recommendation

Recommendation:

Given the complexity of Michigan's water rights and laws, the state's water resources, and the potential for conflict, the Water User Group Planning Committee recommends that EGLE develop a WUC User's Manual to equip WUCs with information, tools, and resources to develop realistic shared solutions to sustainably manage water use. The goal of this manual is to provide steps that will assist the WUCs with successfully developing shared solutions for managing water resources.

The WUC manual will be an essential tool for the EGLE Water Use Program and future WUCs. It will educate people about Michigan's water laws and water rights; the role of state agencies and various water user groups; and strategies and best practices for WUCs to achieve success.

The manual should address the three scenarios where WUCs may be convened:

- a. Following a denial by EGLE of a proposed new large withdrawal due to the likelihood of it causing an ARI. The WUC would be convened by the water user(s).
- b. Following a determination by EGLE that an ARI is occurring or is likely to occur and no WUC already exists. The WUC would be convened by EGLE.
- c. Large quantity water users choose to self-convene to proactively manage local water resources and plan for future use.

2.) Water Conservation Workgroup

Jeremiah Asher, Tom Frazier, Emily Finnell, Kelly Turner,
Abigail Eaton, Frank Ettawageshik, Jason Walther

Water Conservation Workgroup

Conduct an assessment

Compare Water Use Advisory Council recommendations and the MI Water Strategy recommendations ranking by effort and impact

Compile rankings into a matrix to highlight which recommendations should be prioritized

2 Recommendations rose to the top

WC1.2 (Michigan Water Strategy Goal 5, Recommendation 2)

WC 1.3 (Michigan Water Strategy Goal 5, Recommendation 4)

Water Use Advisory Council		MI Water Strategy		
Number	Recommendation	Link	Number	Recommendation
WC 1.2	Based on the water use trends, more focus needs to be placed on conservation and efficiency in the Irrigation Sector. MDARD has developed comprehensive guidance in the form of Generally Accepted Agricultural and Management Practices (GAAMPs), which includes guidance in preparing a water conservation and efficiency plan. MDARD and Michigan State University (MSU) Cooperative Extension should continue to provide and expand training and outreach to the Irrigation Sector to increase the use of these GAAMPs.	G5-2, G5-6	G5-2	Establish voluntary water efficiency targets for all major water sectors to reduce water use impacts and costs.
WC 1.3	The DEQ should incentivize water conservation and efficiency in the public sector by rewarding the implementation of water conservation and efficiency measures when applying for State funding for water infrastructure projects. This could be accomplished by providing significant points to project plans from water systems that already have a water conservation and efficiency plan, thereby increasing the likelihood that the project will be funded.	G5-2, G5-6	G5-3	Promote innovative technologies that reduce cost and water loss, or convert waste products to usable materials.

Additional Priority

WC 2.2 (Michigan Water Strategy Goal 5, Recommendation 6) and subsequent recommendations WC 2.2a-d, with emphasis on WC 2.2 b

Water Use Advisory Council		MI Water Strategy		
	Recommendation	Link		
Number			Number	Recommendation
WC 2.2	Michigan should revise its water conservation program to: 1) further inform and encourage water conservation, and 2) assess and document the nature and extent of water conservation practiced by large water users. This program should consist of the following components:	G5-7	G5-6	Define measures of agriculture water conservation and establish voluntary targets for utilizing best management practices (BMPs) that reflect conformance with the Irrigation Water Use Generally Accepted Agricultural and Management Practices in areas of existing or potential water stress.
WC 2.2a	Michigan should convene a multi-interest workgroup to identify existing and new opportunities to incentivize water conservation. This effort should target all water users and encourage conservation generally, the adoption of specific practices, and contribution to improved data collection.	G5-4 other recs	G5-7	Enhance voluntary water conservation measures through technology and outreach for agriculture to optimize water use while reducing impacts and costs.
WC 2.2b	Among the specific practices encouraged should be a water auditing program. For public supplies, the water audit should be in conformance with the American Water Works Association (AWWA), M36 Water Audits and Loss Control Programs. Water users should be encouraged to develop a water conservation program based on the results of the audit. While each water user is able to determine the nature and extent of its conservation program, incentives should specifically encourage a component on metrics for evaluating the performance of the program and reporting of results to the DEQ or MDARD. Providing information to employees or water customers on the water user's conservation programs and policies should also be encouraged.	G6-4, G6-6	G6-2	Utilize pricing and funding strategies to support infrastructure improvements while allowing for water conservation.
WC 2.2c	To facilitate the above set of activities, the DEQ and MDARD should develop, or arrange for the development of, templates for water audits and conservation plans. These instruments should be considered by the multi-interest group.	G6-6	G6-4	Incentivize and require outcome-based asset management planning for all public water utilities that includes more efficient use of resources.
WC 2.2d	The multi-interest workgroup should also be charged with developing a process for evaluating the results of the incentive-based system. This process should include metrics and data collection and evaluation methodologies. Ideally, metrics should be based on outcomes (e.g., volume of water conserved) rather than outputs (e.g., number of conservation practices adopted).		G6-5	Establish sustainable funding mechanisms to achieve the Water Strategy goals including water infrastructure management.

Implementation Strategies Committee Update

8. Next Meetings

- October 20, 2020
- December 15, 2020

9. Open Comments

10. Motion to Adjourn
